Name: Date:

Polynomial Factoring solution (version 615)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 6x + 36 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(36)}}{2(1)}$$

$$x = \frac{-(-6) \pm \sqrt{36 - 144}}{2(1)}$$

$$x = \frac{6 \pm \sqrt{-108}}{2}$$

$$x = \frac{6 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{6 \pm 6\sqrt{3}\, i}{2}$$

$$x = 3 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-6 - 8i$ and $7 + 2i$ in standard form ($a + bi$).**

Solution

$$(-6 - 8i) \cdot (7 + 2i)$$

$$-42 - 12i - 56i - 16i^2$$

$$-42 - 12i - 56i + 16$$

$$-42 + 16 - 12i - 56i$$

$$-26 - 68i$$

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3. **Write function $f(x) = x^3 - 7x^2 - 6x + 72$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-7	-6	72
4		4	-12	-72
	1	-3	-18	0

$$f(x) = (x - 4)(x^2 - 3x - 18)$$

$$f(x) = (x - 4)(x + 3)(x - 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 2) \cdot (x - 1)^2 \cdot (x - 4)$$

Sketch a graph of polynomial $y = p(x)$.